

(19) World Intellectual Property  
Organization  
International Bureau



(43) International Publication Date  
17 March 2005 (17.03.2005)

PCT

(10) International Publication Number  
**WO 2005/024365 A2**

(51) International Patent Classification<sup>7</sup>: **G01K**

(US). BLEVINS, Daniel, C. [US/US]; 320 Ragan Drive, Apt. D-4, Christiansburg, VA 24073 (US).

(21) International Application Number:  
PCT/US2004/028625

(74) Agent: **THAN, H., T.**; The H.T. Than Law Group, 1010 Wisconsin Avenue, N.W., Suite 560, Washington, D.C. 20007 (US).

(22) International Filing Date:  
2 September 2004 (02.09.2004)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:  
10/653,996 4 September 2003 (04.09.2003) US  
60/499,725 4 September 2003 (04.09.2003) US

(63) Related by continuation (CON) or continuation-in-part (CIP) to earlier applications:  
US 10/653,996 (CIP)  
Filed on 4 September 2003 (04.09.2003)  
US 60/499,725 (CIP)  
Filed on 4 September 2003 (04.09.2003)

(71) Applicant (for all designated States except US): **LUNA ENERGY, LLC** [US/US]; 309 North Knollwood Drive, Blacksburg, VA 24060 (US).

(72) Inventors; and

(75) Inventors/Applicants (for US only): **ZERWEKH, Paul**, S. [US/US]; 2165 Mount Pleasant Road, Shawsville, VA 24162 (US). **BOYD, Clark, D.** [US/US]; 7458 Brandon Road, Radford, VA 24141 (US). **CHILDERS, Brooks** [US/US]; 1425 Red Hawk Run, Christiansburg, VA 24073

(81) Designated States (unless otherwise indicated, for every kind of national protection available): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, SD, NA, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, UZ, VC, VN, YU, ZA, ZM, ZW.

(84) Designated States (unless otherwise indicated, for every kind of regional protection available): ARIPO (BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PL, PT, RO, SE, SI, SK, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

**Declaration under Rule 4.17:**

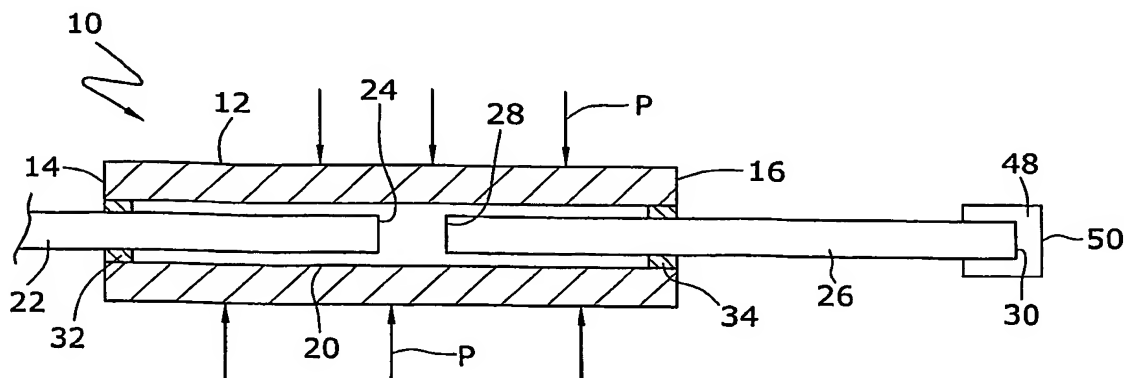
— of inventorship (Rule 4.17(iv)) for US only

**Published:**

— without international search report and to be republished upon receipt of that report

[Continued on next page]

(54) Title: OPTICAL SENSOR WITH CO-LOCATED PRESSURE AND TEMPERATURE SENSORS



(57) Abstract: An optical sensor (10) that provides for concurrent pressure and temperature measurements at substantially the same location includes at least one launch fiber (22) and at least one temperature sensitive material (52) having a refractive index that changes with a change in temperature. The launch fiber and temperature sensitive material are spaced from each other across a gap (21) having length (L). A reflecting fiber (26) can be provided adjacent the temperature sensitive material. The optical sensor (10) also includes a sealed cavity (20). The launch fiber (22) and reflecting fiber (26) can be attached to the tube and at least partially disposed within the cavity. Changes in pressure change the length (L) of the gap (21).



---

*For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.*